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Automated Software Engineering
NASA Ames / RIACS

List of Publications¹

1 Book

- [1] J. Schumann Automated Theorem Proving in Software Engineering. ISBN 3-540-67989-8. Springer Verlag, 2001.

2 Peer-Reviewed Articles in Books, Journals, and Workshop and Conference Proceedings

- [1] B. Fischer and J. Schumann. Applying Autobayes to the Analysis of Planetary Nebulae Images. In *Proc. Automated Software Engineering '03*, IEEE, 2003.
- [2] J. Schumann, P. Gupta, and S. Nelson. On Verification & Validation of Neural Network Based Controllers. In *Proc. Engineering Applications of Neural Networks (EANN'03)*. 2003.
- [3] G. Scheler and J. Schumann. Presynaptic modulation as fast synaptic switching: state-dependent modulation of task performance. In *Proc. IJCNN 2003*, 2003.
- [4] A.G. Gray, B. Fischer, J. Schumann, and W. Buntine. Automatic derivation of statistical algorithms: The EM family and beyond. In *NIPS-15*. MIT Press, 2003.
- [5] B. Fischer and J. Schumann. AutoBayes: A System for Generating Data Analysis Programs from Statistical Models. *Journal Functional Programming*, 2003.

¹Selected publications available on <http://ase.arc.nasa.gov/schumann>.

- [6] J. Schumann, B. Fischer, M. Whalen, and J. Whittle. Certification Support for Automatically Generated Programs. In *Proceedings of the Thirty-Sixth Annual Hawaii International Conference on System Sciences (HICSS-36)*, 2003, IEEE Press.
- [7] J. Schumann and S. Nelson. Toward V&V of Neural Network Based Controllers. In *Proceedings WOSS (Workshop on Self-Healing Systems, 2002*, pages 67–72, ACM Press.
- [8] M. Whalen, J. Schumann, and B. Fischer. Synthesizing Certified Code. In *Proceedings FME 2002*, volume 2391 of LNCS, pages 431–450, Springer, 2002.
- [9] M. Whalen, J. Schumann, and B. Fischer. Combining Program Synthesis with Automatic Code Certification (System Description). In *Conference on Automated Deduction (CADE)* , volume 2392 of LNAI, pages 290–294, Springer, 2002 .
- [10] J. Whittle and J. Schumann. Scenario-based Engineering of Multi-agent Systems. In Chr. Rouff (ed.), *Formal Approaches to Agent-based Systems*, Kluwer, 2002 (in print).
- [11] B. Fischer and J. Schumann. Automated Synthesis of Statistical Data Analysis Programs In *Proc. Workshop SDP (Science Data Processing) 2002*, NASA Goddard, 2002.
- [12] J. Schumann. Automatic Synthesis of Safety-Related Software. In *Proc. AAAI Spring Symposium Series, 2002, Workshop on Logic-based Program Synthesis: State of the Art and Future Trends*, AAAI, 2002.
- [13] J. Whittle, J. van Baalen, J. Schumann, P. Robinson, T. Pressburger, J. Penix, P. Oh, M. Lowry, and G. Brat. Amphion/NAV: Deductive Synthesis of State Estimation (short paper). In *Proceedings of the 16th Automated Software Engineering Conference 2001 (ASE 2001)*. IEEE Press, 2001.
- [14] J. Schumann and P. Robinson. [] or SUCCESS is Not Enough: Current Technology and Future Directions in Proof Presentation. In *Proc. Workshop on Future Directions in Automated Deduction*, IJCAR 2001, 2001.
- [15] B. Fischer, T. Pressburger, G. Rosu, and J. Schumann. The AutoBayes Program Synthesis System, System Description. In *Proc. Calculemus-2001*, 2001.

- [16] B. Fischer, J. Schumann, and T. Pressburger. Generating Data Analysis Programs from Statistical Models. In Proc. SAIG2000, volume 1924 of LNCS, pages 212–229. Springer, 2000.
- [17] J. Schumann. Automatic Debugging Support for UML Designs. In *Proc. Fourth International Workshop on Automatic Debugging*, available as <http://xxx.lanl.gov/abs/cs.SE/0011017>, 2000.
- [18] J. Schumann and J. Whittle. Automatic Synthesis of Agent Designs in UML. In *Proc. FAABS 2000*, volume 1871 of LNCS. Springer, 2000.
- [19] J. Whittle and J. Schumann. Generating Statechart Designs From Scenarios. In *Proc. ICSE 2000*, pages 314–323. IEEE, 2000.
- [20] Johann Schumann. PIL/SETHEO: A Tool for the automatic Analysis of Authentication Protocols. In *Proc. Computer Aided Verification (CAV) '99*, LNAI, pages 500–503. Springer, 1999.
- [21] Johann Schumann. Automated theorem proving in high quality software design. In S. Hölldobler, editor, *Intellectica and Computational Logic: Papers in Honor of W. Bibel*. Kluwer, 1999.
- [22] J. Schumann. Automatische Verifikation von Authentifikationsprotokollen. *KI*, 1998. (in German).
- [23] Johann Schumann (ed.). Automated Deduction in Software Engineering and Hardware Design. In W. Bibel and P. Schmitt, editors, *Automated Deduction. A basis for applications*, volume III.2, pages 99–104. Kluwer, 1998.
- [24] Johann Schumann, Christian Suttner, and Andreas Wolf. Parallel Theorem Provers based on SETHEO. In W. Bibel and P. Schmitt, editors, *Automated Deduction. A basis for applications*, chapter II.7, pages 261–290. Kluwer, 1998.
- [25] Bernd Fischer, Johann Schumann, and Gregor Snelting. Deduction based component retrieval. In W. Bibel and P. Schmitt, editors, *Automated Deduction. A basis for applications*, chapter III.11, pages 265–292. Kluwer, 1998.
- [26] Ingo Dahn and Johann Schumann. Using Automated Theorem provers in Verification of Protocols. In W. Bibel and P. Schmitt, editors, *Automated Deduction. A basis for applications*, chapter III.8, pages 195–224. Kluwer, 1998.

- [27] Johann Schumann and Bernd Fischer. NORA/HAMMR: Making Deduction Based Component retrieval Practical. In *Proc. 12th Conf. on Automated Software Engineering (ASE)*, pages 246–254. IEEE Press, 1997.
- [28] Johann Schumann. Automatic Verification of Cryptographic Protocols with SETHEO. In *Conference on Automated Deduction (CADE) 14*, LNAI, pages 87–100. Springer, 1997.
- [29] A. Wolf and J. Schumann. ILF-SETHEO: Processing Model Elimination Proofs for Natural Language Output. In *Conference on Automated Deduction (CADE) 14*, pages 61–65, 1997.
- [30] B. Fischer and J. Schumann. SETHEO Goes Software Engineering: Application of ATP to Software Reuse. In *Conference on Automated Deduction (CADE) 14*, pages 65–68. Springer, 1997.
- [31] M. Moser, O. Ibens, R. Letz, J. Steinbach, C. Goller, J. Schumann, and K. Mayr. SETHEO and E-SETHEO: The CADE-13 Systems. *Journal Automated Reasoning*, 18:237–246, 1997. In Journ Automated Deduction, Chicago, Il., USA, April 1996.
- [32] J. Schumann. SiCoTHEO — Simple Competitive parallel Theorem Provers based on SETHEO. In J. Geller, V. Kumar, and C.B. Suttnner, editors, *Parallel Processing for Artificial Intelligence 3*, Machine Intelligence and Pattern Recognition 20, pages 231–246. Elsevier, 1997.
- [33] J. Schumann. SiCoTHEO: Simple Competitive parallel Theorem Provers. In *Conference on Automated Deduction (CADE) 13*. newblock volume 1104 of LNAI. newblock pages 240–244. Springer, 1996.
- [34] J. Schumann. Using SETHEO for Verifying the Development of a Communication Protocol in FOCUS – A Case Study –. In P. Baumgartner, R. Hähnle, and J. Posegga, editors, *Proc. of Workshop Analytic Tableaux and Related Methods, Koblenz*, volume 918 of LNAI, pages 338–352. Springer, 1995.
- [35] G. Scheler and J. Schumann. A Hybrid Model of Semantic Inference. In Alex Monaghan, editor, *Proceedings of the 4th International Conference on Cognitive Science in Natural Language Processing (CSNLP 95)*, 1995.
- [36] J. Schumann and M. Jobmann. Analysing the Load Balancing Scheme of a Parallel System on Multiprocessors. In *Proc. PARLE 94*, volume 817 of LNCS, pages 819–822. Springer, 1994.
- [37] Chr. Goller, R. Letz, K. Mayr, and J. Schumann. SETHEO V3.2: Recent Developments (System Abstract) . In *Proc. CADE 12*, pages 778–782, June 1994.

- [38] J. Schumann (editor). Tableaux-based Theorem Provers: Systems and Implementations. *Journal Automated Reasoning*, 13:409–421, 1994.
- [39] C.B. Suttner and J. Schumann. Parallel Automated Theorem Proving. In L. Kanal, V. Kumar, H. Kitano, and C. Suttner, editors, *Parallel Processing for Artificial Intelligence I*, pages 209–257. Elsevier, 1993.
- [40] J. Schumann. DELTA — A Bottom-up Preprocessor for Top-Down Theorem Provers, System Abstract. In *Conference on Automated Deduction (CADE) 12*, volume 814 of *LNAI*, pages 774–777. Springer, 1994.
- [41] R. Letz, J. Schumann, S. Bayerl, and W. Bibel. SETHEO: A High-Performance Theorem Prover. *Journal of Automated Reasoning*, 8(2):183–212, 1992.
- [42] M. Jobmann and J. Schumann. Modelling and Performance Analysis of a Parallel Theorem Prover. In *ACM SIGMETRICS and PERFORMANCE ‘92, International Conference on Measurement and Modeling of Computer Systems, Newport, Rhode Islands, USA*, volume 20, SIGMETRICS and IFIP W.G. 7.3, June 1992. ACM.
- [43] J. Schumann. Parallel Theorem Provers - an Overview. In B. Fronhöfer and G. Wrightson, editors, *Parallelization in Inference Systems, Dagstuhl, Germany*, pages 26 – 50. Springer, 1992. LNAI 590.
- [44] J. Schumann. KPROP- An AND-parallel Theorem Prover for Propositional Logic implemented in KL1. In D. Kapur, editor, *Conference on Automated Deduction (CADE) 11*, Lecture Notes in Artificial Intelligence, pages 740–742. Springer, 1992.
- [45] M. Jobmann and J. Schumann. Modelling and Performance Analysis of a Parallel Theorem Prover. In A. Lehmann and F. Lehmann, editors, *Messung, Modellierung und Bewertung von Rechensystemen*, volume 286 of *Informatik Fachberichte*, pages 228–243, Neubiberg, September 1991. 6. GI/ITG-Fachtagung, Springer.
- [46] J. Schumann and R. Letz. PARTHEO: a High Performance Parallel Theorem Prover. In M. E. Stickel, editor, *Conference on Automated Deduction (CADE) 10*, LNAI, pages 40 – 56. Springer, 1990.
- [47] W. Ertel, F. Kurfess, R. Letz, X. Pandolfi, and J. Schumann. PARTHEO: A Parallel Inference Machine. In *Proc. PARLE ’89: Parallel Architectures and Languages Europe*. volume 365 of *LNCS*, pages 458–476, Springer 1989.
- [48] W. Ertel, J. Schumann, and Ch. Suttner. Learning Heuristics for a Theorem Prover using Back Propagation. In *Proc. ÖGAI 1989*. Springer, 1989.

- [49] R. Letz, S. Bayerl, and J. Schumann. SETHEO, A SEquential THEorem prover for first order logic. In *ESPRIT Technical Week, Brussels*, 1988.
- [50] S. Bayerl, E. Eder, F. Kurfeß, R. Letz, and J. Schumann. An Implementation of a Prolog-like Theorem Prover based on the Connection Method. In Ph. Jorrand and V. Sgurev, editors, *AIMSA: Artificial Intelligence II: Methodology, Systems, Applications*, pages 29–36. North-Holland, 1987.
- [51] W. Bibel, R. Letz, and J. Schumann. Bottom-up Enhancements of Deductive Systems. In I. Plander, editor, *Artificial Intelligence and Information-Control Systems of Robots 87*, pages 1–9. North-Holland, 1987.
- [52] W. Bibel, F. Kurfeß, K. Aspetsberger, P. Hintenaus, and J. Schumann. Parallel inference machines. In *Future Parallel Computers*, pages 185–226. Springer, 1986.

3 Technical Reports

- [1] D. Mackall, S. Nelson, and J Schumann. Verification and Validation of Neural Networks of Aerospace Applications. NASA Report CR-211409, 2002.
- [2] M. Whalen, J. Schumann, and B. Fischer. Synthesizing Certified Code. RIACS Technical Report 02.03.
- [3] J. Schumann und M. Breitling. Formalisierung und Beweis einer Verfeinerung aus AUTOFOCUS mit automatischen Theorembeweisern, Fallstudie. SFB-Bericht SFB342, Institut für Informatik, Technische Universität München, 1998.
- [4] J. Schumann. Automatic Verification of Cryptographic Protocols Using SETHEO. AR-Report AR-96-03, Institut für Informatik, Technische Universität München, 1996.
- [5] P. Baumgartner und J. Schumann. Implementing Restart Model Elimination and Theory Model Elimination on top of SETHEO. Forschungsbericht 5–95, Universität Koblenz-Landau, 1995.
- [6] J. Schumann. Using SETHEO for verifying the development of a Communication Protocol in FOCUS – a case study –. SFB-Bericht SFB342/20/94A, Technische Universität München, 1994 (long version).

- [7] J. Schumann und M. Moser. A Graphical User Interface for SETHEO — A Proposal. Technische Bericht 173-92, Institut für Informatik, Technische Universität München, 1992.
- [8] W. Ertel, C. Suttner, J. Schumann und R. Weber. Formalisms and Languages for Specification of Parallel Inference Systems. SFB Bericht SFB 342/22/91 A, Technische Universität München, 1991.
- [9] M. Jobmann und J. Schumann. Modelling and Performance Analysis of a Parallel Theorem Prover. SFB Bericht SFB 342/20/91 A, Technische Universität München, 1991.
- [10] J. Schumann. KPROP: A Model Elimination Theorem Prover for Propositional Logic implemented in KL1. Technical report, ICOT, Tokyo, Japan, 1991.
- [11] J. Schumann. Combining Top-Down and Bottom-Up Theorem Proving: First Experiments. Technical report, ICOT, Tokyo, Japan, 1991.
- [12] J. Schumann. Parallelisation of Inference Systems using an Abstract Machine. SFB Bericht SFB 342/24/91 A, Institut für Informatik, Technische Universität München, 1991.
- [13] J. Schumann, N. Trapp und M. van der Koelen. SETHEO/PARTHEO: User's Manual. SBF-Bericht TUM-I 9010. SFB342/7/90 A, Technische Universität München, SFB 342, 1990.
- [14] R. Letz, S. Bayerl, J. Schumann und B. Fronhöfer. The Logic Programming Language LOP. Technischer Bericht, ATP-Report, Technische Universität München, 1989.
- [15] S. Bayerl, R. Letz und J. Schumann. SETHEO, A SEquential THEorem prover for first order logic. Technischer Bericht, ATP-Report, Technische Universität München, 1988.
- [16] R. Letz und J. Schumann. Global Variables in Logic Programming. Technischer Bericht FKI-96-b-88, Technische Universität München, 1988.